

DOCUMENT RESUME

ED 308 687

EC 220 563

AUTHOR McEvoy, Christopher; And Others
TITLE The Use of Massage Therapy in the Treatment of
Self-Injurious Behavior.
INSTITUTION Wayne County Intermediate School District, Detroit,
Mich.
PUB DATE 87
NOTE 73p.
PUB TYPE Reports - Evaluative/Feasibility (142)

EDRS PRICE MF01/PC03 Plus Postage.
DESCRIPTORS *Autism; *Behavior Change; Case Studies; *Self
Destructive Behavior; Self Mutilation; *Severe Mental
Retardation; *Sleep; *Therapy
IDENTIFIERS *Massage Therapy

ABSTRACT

The report documents the theoretical basis and application of massage therapy, with six students who exhibited self-injurious behaviors (SIB), in two studies. The first study investigated the relationship between physical and/or emotional stress and self-abusive behavior in five severely mentally impaired students. Subjects received two to three 45-minute massage treatments per week. The program appeared to benefit three of the five subjects, who showed both quantitative and qualitative behavior improvements. The two remaining subjects had severe autistic characteristics which made the physical contact of massage therapy difficult. The second study describes a 15-year-old male with severe insomnia as well as very frequent self-injurious behavior. Massage therapy (three or four sessions per week) was added to his behavioral education program. The subject began to sleep 9 to 12 hours per night immediately with the introduction of massage therapy. A substantially decreased incidence of SIB was also observed. (DB)

* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *

ED308687

U.S. DEPARTMENT OF EDUCATION
Office of Educational Research and Improvement
EDUCATIONAL RESOURCES INFORMATION
CENTER (ERIC)

- ☒ This document has been reproduced as received from the person or organization originating it.
- ☐ Minor changes have been made to improve reproduction quality.
- Points of view or opinions stated in this document do not necessarily represent official OERI position or policy.

THE USE OF MASSAGE THERAPY IN THE TREATMENT OF SELF-INJURIOUS BEHAVIOR

Christopher McEvoy

Ann Perrault

Jan Graetz

WAYNE COUNTY INTERMEDIATE SCHOOL DISTRICT

BEST COPY AVAILABLE

"PERMISSION TO REPRODUCE THIS
MATERIAL HAS BEEN GRANTED BY

*Christopher
J. McEvoy*

TO THE EDUCATIONAL RESOURCES
INFORMATION CENTER (ERIC)."

EC 220563

Board of Education

Charles D. Akey
Boyd W. Arthurs
Armen Barsamian
Mary E. Blackmon
Kathleen M. Chorbajian

Dr. William Simmons, Superintendent

THE USE OF MASSAGE THERAPY IN THE TREATMENT OF
SELF-INJURIOUS BEHAVIOR

Wayne County Intermediate
School District

1987

Christopher McEvoy
Ann Perrault
Jan Graetz

TABLE OF CONTENTS

Acknowledgments	4
Foreword	5

Part One

Evaluation of Massage Therapy Program (WCISD) 1986

<u>Introduction</u>	8
Characteristics of the Program	10
Participants	11
<u>Evaluation Design</u>	
Purpose	11
Timelines	13
Instrumentation	13
Procedure	14
Results - Quantitative	14
<u>Discussion</u>	
Case One - I.C.	16
Case Two - M.A.	20
Case Three - L.S.	26
Case Four - K.C.	32
Case Five - B.B.	37
Conclusion	42
References	45
Appendix	46

Part Two

Massage Therapy in the Treatment of Insomnia and Self-Injurious Behavior: A Longitudinal Case Study

Introduction	50
--------------------	----

TABLE OF CONTENTS continued

Post-Hoc Case Study	52
<u>Case Study - N.W.</u>	
Background	53
Behavioral Education Program	55
Physiological Agitation	57
Procedure - Massage Therapy	60
Data Collection	61
<u>Results/Discussion</u>	
Descriptive - Massage Therapy	62
Sleep Behavior	64
Self-Injurious Behavior	67
Conclusion	68
References	70

ACKNOWLEDGMENTS

The author wishes to gratefully acknowledge:

Donna Sewrey for consultative and administrative support;
Shea Howell for critical evaluation of earlier drafts;
Beverly Parke, Wayne State University for research consultation;
Diane Gorney for manuscript preparation and typing;
and Nancy Hurd for graphics contribution.

Additional administrative support was provided by James Hutchinson (Moses Field School), George Waters (Hale School), Wayne Ruchgy (Chapter I Operations - WCISD), James Kubaiko (Director of Special Education - WCISD), and James Greiner (Assistant Superintendent - WCISD).

Special thanks are extended to the students, staff, parents, and caregivers directly involved in this program, especially Anna Moss (Hale School), Dovie Lee (Moses Field), and Johnnie Shelton.

FOREWORD

Students who are mentally impaired in addition to having behavior problems, such as chronic self-abuse, offer the most difficult challenges to educators, parents, and caregivers. Self-abusive behavior seriously impedes the child's learning, growth, and happiness. Current practices and research in this area indicate, however, that progress is being made in understanding and treating people with these behaviors. It has been recognized that the motivations and causes of self-abuse can be complex and varied. A variety of approaches to treatment have been developed including behavioral and communication-oriented methods, community-based and functional skills education, and sensory and environmental enrichment.

Still there seems to be a small percentage of self-abusive individuals whose behavior is not amenable to any of these approaches. This type of person appears to be agitated or troubled from within, tends to be explosive or in a constant state of tension or nervousness. Frequently these individuals are put on relaxant or psychotropic medications for these chronic conditions. Long term use of these drugs however, may be problematic (and ineffective) because of their potentially serious negative side effects, such as the condition of tardive dyskinesia.

Practitioners have begun to experiment with techniques aimed at this problem, such as regulated exercise and relaxation procedures. In the present program massage therapy has been used to address this problem.

The project began in 1985 at Moses Field School in Detroit, a program operated by Wayne County Intermediate School District for students with severe impairments. This report will document the theoretical basis and application of this approach with six students that exhibited self-injurious behaviors.

The report is presented in two parts as separate studies that can be read independent of each other.

Chris McEvoy

PART ONE

EVALUATION OF MASSAGE THERAPY PROGRAM
WAYNE COUNTY INTERMEDIATE SCHOOL DISTRICT

1986

-7-

10

INTRODUCTION

A common behavior problem found within the population of severely and profoundly mentally-impaired students is self-abusive behavior. This includes such behaviors as face-hitting, hand-biting, and head-banging. There are several theories on the etiology of self-abuse in this population (Carr, 1977). These include the following: 1. self-abuse is maintained by positive social reinforcement (i.e. attention); 2. self-abuse is maintained by the termination of an aversive stimulation (negative reinforcement hypothesis); 3. self-abuse provides sensory stimulation for those experiencing some form of sensory deprivation; 4. or self-abuse is caused by aberrant physiological processes. Research on the physiological basis of self-abuse has been focused primarily on two genetically based disorders, Lesch-Nyhan (Libby, Polloway, and Smith, 1983) and Cornelia de Lange Syndrome (Berg, McCreary, Ridler, and Smith, 1970). Some research (de Lissovoy, 1963) has suggested that painful middle ear infections may also be a source of self-abuse in some children.

The present study was intended to investigate the relationship between general states of physical and/or emotional stress and self-abusive behavior in severely mentally-impaired students. It was recognized that some self-abusive students display other behaviors that indicate a general state of tenseness or inability to relax. These may include behaviors such as hyperstimulation to environmental conditions, trembling or excessive body-rocking, hand-wringing, hyperventilation,

extreme resistance to physical contact, uncontrolled motor activity, or disturbed patterns of sleep. In most of these individuals intense self-abuse appears to occur as the most extreme expression of agitation.

Treatment of self-abusive behavior has been limited primarily to behavioral methods based upon either positive or negative reinforcement hypotheses. Some treatment utilizes a sensory integrative approach (Wells and Smith, 1983). These treatments alone however may have a limited effectiveness with individuals whose self-abuse is caused primarily by excessive physiological arousal (Cataldo and Harris, 1982). This aspect of the student's behavior may typically be dealt with through the use of psychotropic medications or relaxants. Oftentimes however, these drugs are ineffective in the long-term reduction of agitated behaviors. The need for effective methods of relaxation for these individuals is great and has led the present investigators to consider the possibility of massage therapy.

Massage therapy has been used for many years within various cultures as a technique to increase relaxation, in addition to providing other benefits to the health of individuals. It was reasoned that a program of massage therapy may be effective in increasing relaxation and thereby reducing the agitated behaviors of individuals who were identified as having this particular combination of problems (i.e. self-abuse and physical agitation). Massage therapy was considered an especially appropriate relaxation technique with this group because it's physical methodology does not require higher level cognitive skills on the part of the recipient as other relaxation techniques do (e.g. progressive muscle relaxation, visual imagery, etc.).

Characteristics of the Program

The following were characteristics of the behavioral massage therapy program:

1. Participants received two to three 45 minute massage treatments per week by the project's certified myomassologist scheduled within the course of their school day. Sessions were administered non-contingent on any specific behaviors of the student. Elements of a student's ongoing educational behavior plan were incorporated throughout the session as necessary.
2. Some of the massage techniques utilized included:
 - a. Therapeutic massage (Tappan, 1980) which is a variety of manipulations such as effleurage (gliding), petrissage (kneading), tapotement (striking), and vibration. Movements are applied to the skin by means of soft tissue compression, producing mechanical stimulation that has the effect of reducing nervous energy and increasing the functional activity of the skin.
 - b. Active and passive exercise is the engagement of various muscles throughout the body in resistance and counterresistance.
 - c. Acupressure or pressure point stimulation (Thie, 1973).
 - d. Craniosacral therapy (Upledger and Vredevoed, 1983) which is the manual stimulation of cranial sutures aimed at mobilizing the entire craniosacral system which includes vault bones, meningeal membranes, vascular and nerve structures, and cerebral spinal fluid.

The therapist in this program used her experience and judgment in determining the appropriate techniques for each student. The selection of specific techniques to be used with individuals may have changed over the course of the program.

Participants

Five students participated in the program (see Table One). Three females and two males ranged in age from 14 to 24 years old. One lived in a state institution, another lived in a group home, still another lived in a foster home, and two lived with their natural mothers. All five students were classified severely mentally-impaired. All had long histories of severe behavior problems, including self-abuse. For at least three of these students the behaviors could be described as life-threatening to themselves. Some additional behavior problems found within this group included hyperactivity, severe aggression, sleep disorder, stripping, extreme social withdrawal, inappropriate sexual behaviors, severe autistic characteristics, and extreme nervousness. All five students were on behavior treatment plans throughout the study and attended either a self-contained or behavioral resource room at school. One student, K.C., began a new behavioral program simultaneous to the introduction of massage therapy.

EVALUATION DESIGN

Purpose

The purpose of this study was to evaluate the following two questions:

TABLE ONE

Student	Age/Sex	Cognitive/Physical Characteristics	Behavioral Characteristics
I.C.	22 year old female	Ambulatory Regressed from Trainable level of functioning; Easily imitative	Self-abusive Withdrawn/Afraid to initiate anything; Many repetitive mannerisms
M.A.	15 year old female	Ambulatory: one leg in a brace; No expressive language	Frequent agitated behaviors: body-rocking, hyperventilation, hand-wringing, hand-biting
L.S.	14 year old male	Ambulatory - good motor skills; No imitative ability; Language consisted of one manual sign	Autistic characteristics: near constant self-stimulation; Head-banging; Easily agitated through over stimulation
K.C.	23 year old female	Ambulatory - prefers to pace almost constantly; No expressive language; Socially oriented	Severe self-abuse to gain attention and to avoid interactions; Long history of institutionalization
B.B.	24 year old male	Ambulatory Very strong and resistant to physical contact; Frequently in physical pain due to severe self-injury; No expressive language	Severe self-abuse, aggression, and agitation; Long history of institutionalization and consumption of cigarette butts for nicotine; Frequent self-stimulation

1. To what extent does a program of massage therapy decrease the self-abusive behaviors of students who have been identified as having difficulty with physical agitation?
2. To what extent does a program of massage therapy decrease behaviors that are indicative of physical or emotional agitation in the same group of severely mentally-impaired students?

Timelines

Evaluation of this program was in the format of five single subject designs using time series analysis. Each student began the study with the same three week baseline period. Treatment for all participants began during the same week and continued through a sixteen week period. A phase-out and withdrawal of massage therapy treatment occurred at the end of the study. Certain participants were recommended for long-term maintenance intervention at that time.

Instrumentation

Question One - Individualized daily behavior observation checklist. Frequency of self-abusive behaviors were recorded on the observation form.

Question Two - Individualized daily behavior observation checklist. Frequency of behavioral indicators of agitation were taken simultaneous with observations of self-abusive behaviors. These behaviors were peculiar to the individual student.

Descriptive Observations - Descriptive observations were recorded by the massage therapist after each session including techniques used and student responses.

Procedure

Questions One and Two - During baseline each student received two randomly selected 15 minute periods of direct observation per school day for measurement of the frequency of self-abusive and agitation behaviors. This was adjusted to one 15 minute period of observation per day during the entire treatment period. Each 15 minute period was divided into three 5 minute intervals. Total frequencies were calculated by dividing the number of intervals during which the behavior was observed by the total observational intervals. Measures of inter-observer agreement were taken once a week throughout the study on both self-abusive and agitation behaviors.

Measures of self-abusive behavior for M.A. were taken by means of event recording by classroom staff. The reason for this was that her episodes were relatively infrequent, but of extremely high intensity, requiring manual restraint by one or two staff people. Inter-observer agreement on this behavior was obtained simultaneous to the daily time-sample observations of her agitation behavior.

RESULTS

Quantitative

Mean frequencies of self-abusive and idiosyncratic agitation behaviors (with the exception of I.C.) during baseline and treatment are presented for each participant in Table 2. Inter-observer agreement ranged from 83% to 100% (Table 2). Figures 1 through 5 present each participant's frequency of self-abuse and agitation behavior plotted on a weekly basis through baseline and the duration of the program.

TABLE TWO

Student	Behavior	Mean Frequency Baseline	Inter- Observer Agreement	Mean Frequency Treatment	Inter- Observer Agreement
I.C.	Self-Abuse	69%	100%	33%	92%
M.A.	Self-Abuse	1.3 ^a	100%	.6 ^a	98%
	Hand-Wringing	92%	100%	60%	98%
L.S.	Self-Abuse	16%	87%	14%	85%
	Repetitive Vocalizations	63%	100%	60%	94%
K.C.	Self-Abuse	29%	83%	31%	100%
	Screaming	38%	83%	19%	100%
B.B.	Self-Abuse	6%	91%	13%	94%
	Hand-Flapping	77%	100%	58%	98%

^a frequency represents rate of episodes per day; all other measures indicate percentage of five minute intervals.

DISCUSSION

Case One - I.C.

This 22 year old female lived with her mother and brother in an inner-city neighborhood of a large urban area. She had no physical impairments. By the age of 10 she spoke simple words and phrases and functioned generally at a "trainable" level. At that time she suffered a traumatic incident which caused her to stop speaking except on rare occasions. After a second incident at the age of 17 she became severely self-abusive. She would strike her jaw and face repeatedly and bang her head on hard surfaces when upset. Her total regression resulted in her transfer to an educational program for the severely impaired. She was a very fearful and nervous person, engaging in many repetitive mannerisms with her head always down and eyes following people.

Her behavior was marked prominently by an inability to initiate anything without adult approval. After being told for example, to "go to the bathroom", she would leave the room and perform the activity with independence. But she would not leave her seat to do anything without immediate adult sanctioning. I.C. exhibited these behaviors both at home and at school. She had been on a long-term prescription of Valium for agitation, but was taken off it during the course of this study.

Also during this time, she was on a behavior plan for management of her self-abuse as part of her school program. This plan consisted of a combination of positive and decelerating techniques including: positive reinforcement utilizing preferred personal hygiene activities, edibles and praise for on-task behavior without self-abuse; communication programming;

and a combination of extinction, redirection, contingent restraint, timeout, and a protective helmet for instances of intense self-abuse. She had been on this behavior plan for at least a year prior to the introduction of massage therapy.

The specific therapeutic objectives developed for I.C. were:

1. Reduce her constant state of tension and increase her ability to relax, as indicated by behaviors such as increased upward head posture and reduction of self-abuse.
2. Increase her openness and communication with people by developing trust in the work of the massage therapist - to express her feelings about her wants and dislikes.

Research Question One

The mean frequency of self-abusive behaviors for I.C. did decrease from 69% to 33% intervals per day (-36%) from the baseline to treatment periods. It is noted that she was absent from school for weeks eight and nine of the program and reportedly was exhibiting high rates of self-abuse during this time. This may have been related to her medication withdrawal. In general, there is a downward trend to the frequency of self-abuse for I.C.

Research Question Two

An agitation behavior for I.C. was dropped from the study because the behavior selected, excessive touching and adjustment of her clothes, was not able to occur during times that she was restrained for self-abuse. Due to the high frequency of restraint during her baseline period, an insufficient sample of this behavior was able to be obtained.

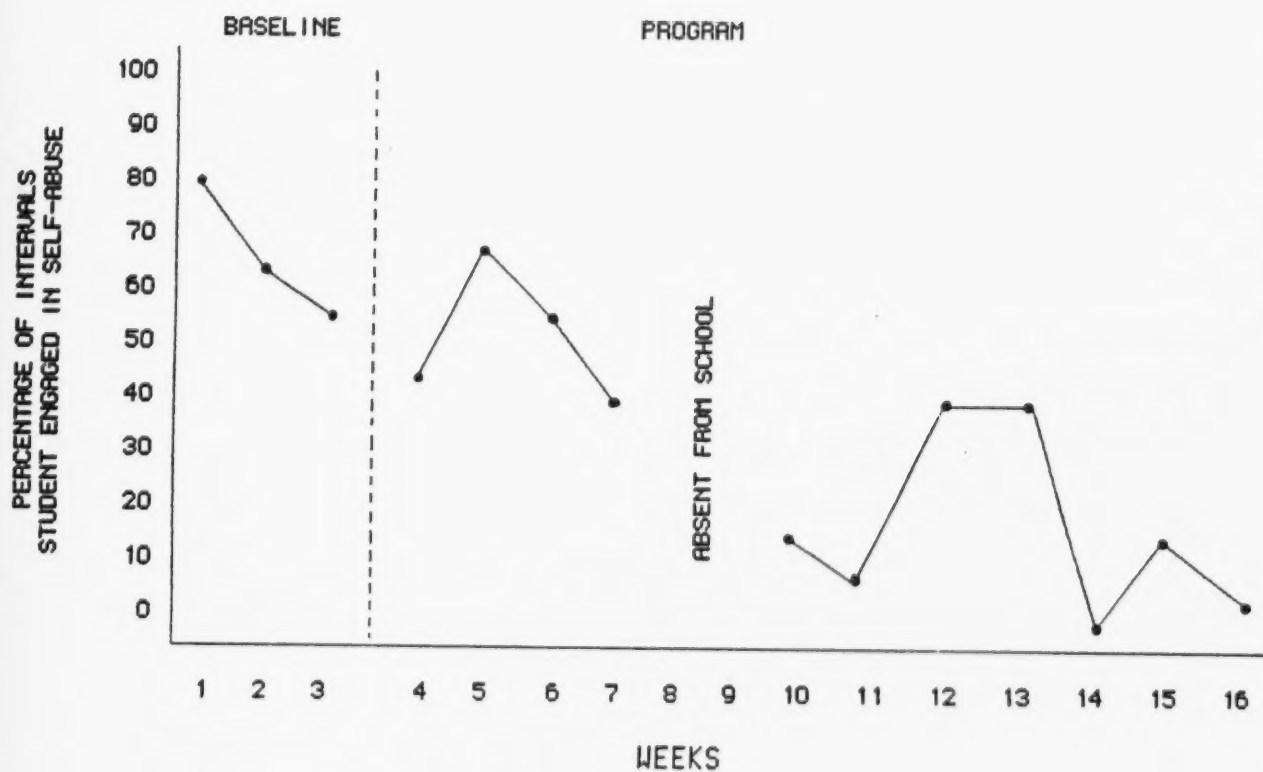


FIGURE 1 I.C.

Descriptive Observations

I.C. showed a definite increase in openness and receptivity to therapy over the course of 14 weeks. The first couple of weeks she frequently held on to the sides of the therapy table and appeared fearful in posture and manners. By the third week she was complying to directives (e.g. "turn over") that indicated an increase in trust. After that she became happy and pleased to cooperate with the therapist for the most part. And even though her self-abuse and emotional state in general continued to fluctuate greatly during the program (as was her long-term pattern), she showed a consistent increase in trusting responses to the massage therapy situation. She also displayed the ability to increase her state of relaxation significantly within an individual session.

The therapist attempted to have I.C. indicate preferences by pointing or talking about areas of the body she wanted to have massaged or that hurt especially. This was fairly successful, though many of her responses had an imitative quality. She did begin to express distinct choices using verbalizations (e.g. "no" in response to a question) - which had been a major objective of her educational program.

Throughout the entire program the therapist concentrated her work on areas of particular stress for I.C. including her neck, shoulders, left arm, jaw, and stomach. The therapist would use soft pressure or massage strokes to manipulate these areas. It was not unusual when working on these areas for I.C. to respond with a great deal of emotion such as smiling and laughing or fear, grimacing, crying, or even slapping her

own face. Being very fearful of any noncompliance to an adult, she would simply endure things being done to her even while expressing extreme emotions. The therapist attempted to show I.C. not only how to give expression to these feelings, but also how to control the actions of herself and the therapist. By the last four weeks of therapy I.C. was enjoying taking over much more control of the routine of the session. She started showing initiative and increased relaxation responses.

I.C. was a very complex young woman with very severe withdrawn and fearful behaviors complicated by a history of traumatizing aggressive actions towards her. It is of course, extremely difficult to understand the victimizing of people with severe mental impairments. Developing effective programs for these people is even more difficult. The trust that she developed with the therapist was significant (though not unique-she had developed a similar relationship with another instructor) for the openness of personality and relaxation she achieved. The level of generalization of the relaxation response was limited however. Though there may have been some effect as evidenced by the quantitative decrease in self-abusive behaviors. But I.C.'s emotional behavior continued to be erratic and undoubtedly was affected by many uncontrollable environmental and social factors in her life.

Case Two - M.A.

M.A. was a 15 year old female who lived with her foster mother and one other developmentally disabled young woman. During her early

childhood, she had experienced malnutrition and suspected neglect, but now appeared healthy and developed. She had been diagnosed as having severe mental retardation, cerebral palsy, and a seizure disorder. She had a history of being on psychotropic medications for extreme fits of agitation and self-abuse, but had been off these drugs for a year prior to the study.

M.A. was ambulatory but wore corrective shoes and a brace on her left foot and ankle. Her walking was characterized by brisk movements, sudden stops and starts, downward head position, increased breathing, and low stamina. According to the massage therapist's evaluation she stored a great deal of tension in her shoulders and hands as evidenced by arthritic joints in the fingers and several areas of callus buildup on the hands and wrists caused by biting and constant wringing of her hands. Her use of objects consisted of holding a few things briefly and then throwing them, though she had learned not to throw her cup of milk until it was empty.

Emotionally M.A. was very child like and subject to extreme sudden changes of affect. Most of the time she would sit staring downward, perhaps rocking lightly and wringing her hands together. She would appear not to be affected by loud noises or activity in a classroom. Suddenly, for no apparent reason, her rocking and breathing would increase rapidly and she would scream out and bite her hands intensely. If blocked from her hands she would bite her leg. She might also jump up and down rapidly. These episodes usually lasted about 15-20 minutes. Their frequency tended to increase around her menstrual cycle, but also

during situations of mealtime and toileting. During a bad time, she might have four or five of these episodes in a school day, but may also go days without any occurrence. At a low intensity these behaviors were dealt with using some verbal and physical redirection. Higher intensities required holding her hands (usually by two classroom staff as she was a very strong girl) or else providing protective devices, such as hand gloves.

Simple relaxation techniques were used with some effectiveness as part of her program, such as use of a rocking chair, relaxation music, and daily hand massage. M.A.'s communication skills consisted of walking to areas such as the sink for a drink or to food that she observed. At times she would walk up to a familiar person and enjoy smiling or being near that person. The overall objective of using massage therapy with M.A. was to produce a generalized relaxation effect in the child that would hopefully positively affect many aspects of her functioning, including reduction of self-abuse.

Research Question One

M.A. showed excellent progress during the massage therapy program. Her rate of high intensity episodes of self-abuse (those requiring manual restraint) decreased from 1.3 per day, or more than once a day during baseline to .6 per day, or about once every two days during the program. Week 13 of the study presented a unique combination of factors (i.e. M.A. was out of her classroom due to the school being painted, was on her menses, and had an irritating treatment for a skin problem on her feet) that appeared to result in excessively high frequency of self-abuse.

Research Question Two

M.A.'s frequency of hand-wringing (defined as anytime her hands came into contact with each other) also decreased dramatically during the program (-32%), though the behavior still occurred more than half the time (Table 2).

Descriptive Observations

The statistical indicators of improvement for M.A. through the massage therapy program are supported by several significant qualitative changes observed by classroom staff, foster mother, and the massage therapist. In general, she achieved an increasingly relaxed appearance and functioning throughout the program. For example, teacher reports indicated that the average duration of episodes of high agitation decreased from over 15 minutes during baseline and long before, to under 5 minutes by mid-way through the program. The intensity of these episodes also decreased to the point of only requiring one staff person for manual restraint. The physical appearance of her hands improved greatly during this time, including reduced swelling and discoloration.

The massage therapist reported that M.A. received a total of 33 sessions each lasting 45-60 minutes. Although M.A. had some previous experience with massage, her initial responses during the first several sessions included some uncertainty and nervousness. Difficulty was had in getting her to lay down or stay in position long enough to work on her. These responses improved greatly however as time went on. During

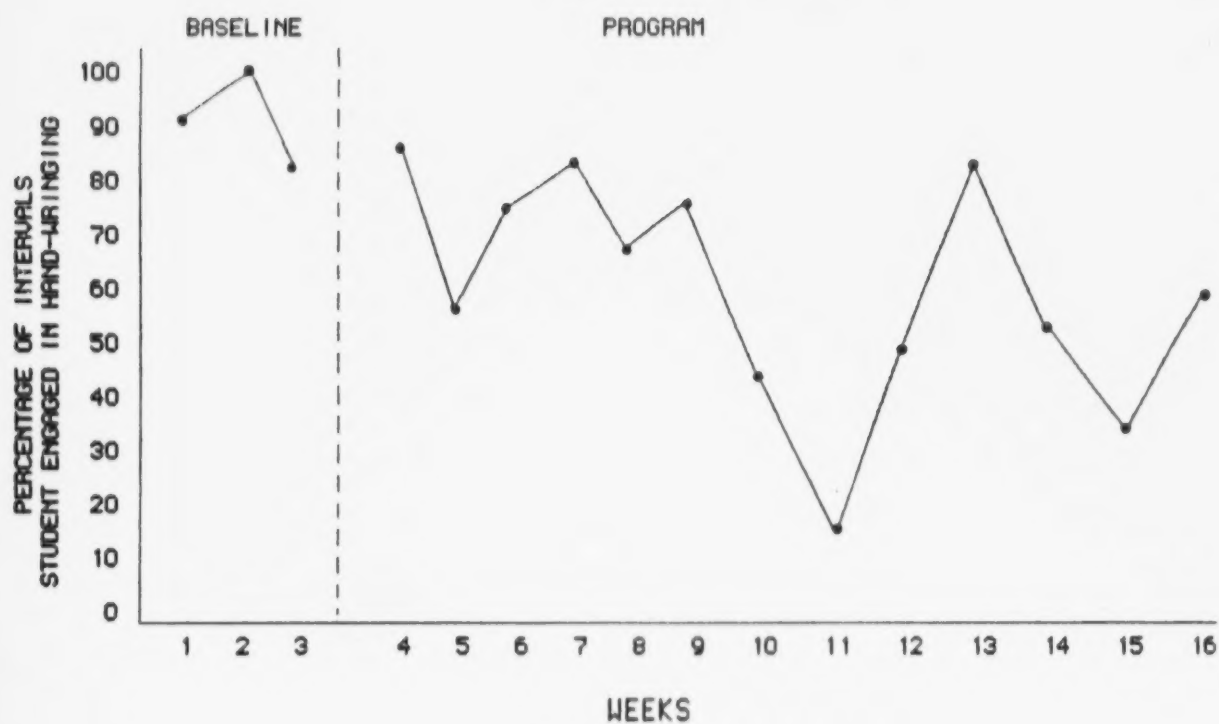
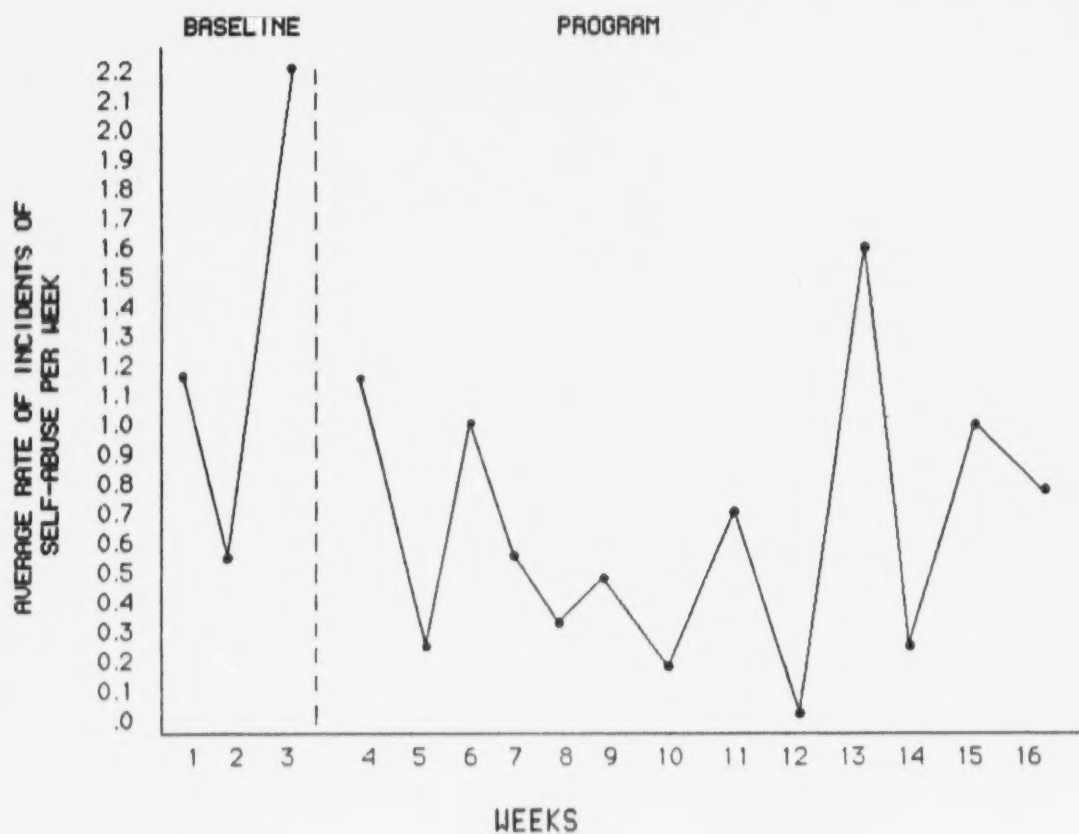


FIGURE 2 M.A.

each session the therapist had to be sensitive to problems that may fluctuate for M.A. on a daily basis (e.g. joint pain or menstrual cycle).

By working through a basic massage routine, the therapist was soon able to produce a very relaxed state in M.A. within many sessions. At times she would fall asleep or lay still, visually alert, fully supine with arms and hands dropped to her sides, while breathing slowly. When the therapist worked on stress areas such as her head, neck, hands, and legs, responses varied from smiling, stretching out of her body or a blank daze to increased jerking motions or hand-biting. The therapist also concentrated work on the stomach and lungs as the program advanced. By the seventh week the therapist noted that muscles were less knotted. The final weeks of therapy showed many "new" behaviors that indicated increased social awareness, curiosity, and communication.

The therapist noted the following by the end of the program:

1. M.A. was showing more awareness of her environment as evidenced by increased eye contact to classroom staff and during massage sessions, an increase in reaching to touch adults in a playful manner, less downward head posture, and increased awareness of the agitation of other students in her classroom.
2. Her hands were apart much more and when she was self-abusive she responded more readily to verbal and light physical prompts (this was noted by classroom staff as well).
3. In therapy sessions she increased her tolerance of laying in prone position, stretching extremities, and manipulations of the head and stomach without self-abuse.

4. There was a decrease in agitated behavior during toileting situations.
5. Use of her hands in manipulating a spoon and feeding herself increased.

In summary, quantitative and qualitative data suggest that this program was extremely beneficial for M.A. in terms of reducing self-abuse and agitated behaviors, in opening a variety of social behaviors, and improved performance in areas of skill acquisition.

Case Three - L.S.

L.S. was a 14 year old, physically agile male who lived at home with his mother and siblings within an inner city neighborhood. He was severely mentally-impaired in addition to displaying extreme autistic characteristics. He engaged in constant self-stimulatory behaviors including body rocking, hand-gazing, head and body slapping, a variety of repetitive vocalizations, head-banging, head-waving, hyperactivity, running, bolting, and jumping out of his seat. Frequently he had two or three of these and other behaviors going simultaneously. At times he would become extremely over-stimulated and distressed, exhibiting loud crying and screaming, jumping up and down, profuse sweating and head slapping. He had a history of ear infections, but there were no apparent external antecedents to these behaviors most of the times that they occurred.

He had learned one manual sign ("eat"), but otherwise had no imitation or language skills. He had a very good memory for missing

objects and a sense of order for things, but scored very low on tests of cognitive development. His extreme hyperactivity and inability to sustain attention to an activity presented significant problems for L.S. both at home and school. Socially he was very resistant to most physical contact, but frequently sought adult attention for activities such as walking or holding hands.

L.S. displayed very specific self-abusive behaviors that were usually performed in a very methodical way, and when he was not in an agitated state. These included striking his forehead in a repeated rhythmic fashion on hard surfaces such as tables or the floor, and banging the bottom of his chin in a similar manner while using his hands as padding. L.S. was on a behavior plan that simply used verbal and gestural directives for him to stop these behaviors. This technique was very successful at school as L.S. was compliant to these directives and did not substitute other self-abusive behaviors. These behaviors appeared to have no socially motivating qualities.

L.S. presented more difficulty at home in that he would engage in these behaviors when not directly observed and would incur damage to his forehead area resulting in a prominent swelling, occasional bleeding, and discoloration of that area. L.S. had a very poor pattern of sleep and would frequently wake in the middle of the night and head bang for extended periods. At the time of the program a protective helmet was beginning to be used with L.S. for this problem in the home with limited success.

The specific massage therapy objectives developed for L.S. included:

1. Increase his tolerance to physical contact so as to investigate manual techniques that might produce a relaxing effect on him with the aim of also improving his pattern of sleep.
2. To relieve cranial pressure that may contribute to his specific self-abusive behaviors utilizing cranio-sacral techniques developed by Dr. John Upledger.

Research Question One

L.S.' rate of self-abuse remained rather stable over the course of the study. There was a negligible difference between rates of self-abuse during baseline and program periods (Table 2). During week 13 of the study, L.S. was kept out of school due to a combination of reasons including a very bad head cold, loss of appetite, sleeplessness, and medication withdrawal.

Research Question Two

The behavior selected to be measured as an additional indicator of physical agitation for L.S. was repetitive vocalizations. This was defined as any sound or combination of sounds repeated by L.S. vocally. The rate of these behaviors remained constant as well throughout the baseline and program periods (Table 2).

Descriptive Observations

In the first several sessions the therapist began with short periods in which she attempted to acclimate L.S. to the therapy situation,

including laying prone and supine on the table. She utilized pressure point application and simple massage to the hands, feet, and neck. L.S.' responses to these procedures varied dramatically over the first few weeks. One session he might jump off the table 7 or 8 times and show extreme mood swings within a 15 minute session. The next session he might be perfectly accepting of all procedures, become very quiet and relaxed and fall asleep by the end of the session.

By the third week the therapist was attempting to do cranio-sacral therapy with L.S. when he could tolerate it. It was not uncommon for him to respond to this technique with frustration and an increase in temperature and vocalizations. Usually he would tolerate the contact of the therapist's hands on different cranial areas, but would become agitated when she took them off and moved to another area. It should be noted that it was not uncommon for L.S. to approach a familiar adult and place their hands on his head. Usually however, he would quickly remove them. It is interesting that he not only allowed the therapist to maintain contact, but became upset when she stopped. By the fifth week of the program, L.S. would pursue the therapist even outside of the therapy situation and place her hands on him.

During the fifth week of the program L.S. was started on psychotropic medication withdrawal. At this time the therapist began to incorporate some massage strokes intended to assist the lymphatic system in the withdrawal process. Many of these sessions were very successful in that he was beginning to consistently achieve a state of relaxation within the session despite a great deal of hyperactive behavior. The time of

sessions were lengthened. For three weeks his frequency of self-abuse hit a low point during the entire study. By the ninth week of the program however, he was having such difficulty sleeping at night that his night time medication was reinstituted. During the final few weeks of the program the therapist did no more work on his body as this only heightened his agitation. She concentrated solely on cranial therapy and attempting to assist in relief of his sinus condition.

In summary, while it is true that no significant quantitative changes occurred in his self-abusive and agitation behaviors, there may have been some value in this program for L.S. The therapy appeared to have very little or no relaxation effect that generalized outside of that situation. In-therapy responses ranged from extreme agitation to full relaxation, but remained inconsistent. The timing of changes in medication of course, affected these behaviors.

Clearly however L.S. experienced some internal difficulty in the cranial area. It is not unusual for autistic children with self-abusive behaviors to focus their abuse on the forehead area. A simplified, hypothetical explanation for this using a cranio-sacral therapy perspective is the following. There exists rhythmic palpitations of cranial vault bones that accommodate pressure fluctuations of the cranosacral system which includes the flow of cerebral spinal fluid (Upledger, 1983). Blockages of tissue movement and fluids can occur that would cause a build-up of internal pressure in these areas. Head-banging in the rhythmic manner characteristic of L.S. for example, may be an attempt to dislodge an obstruction and provide relief from pressure

(Upledger, 1982). Some of the behaviors exhibited by L.S. during this program were consistent with this kind of theoretical model for the cause of these self-abusive behaviors. In his clinical research, Upledger, 1983, had identified a particular type of constraint to the craniosacral system that was characteristic of some autistic children. The program ended, however, at that time without demonstrable improvements in L.S. through that line of work.

Case Four - K.C.

K.C. was born prematurely with a birth weight of three pounds. Her mother had a history of difficulty with pregnancies and had six children born with genetic anomalies, K.C. included. She was ambulatory and had a fairly well controlled seizure disorder. This 23 year old woman had been admitted to a large state institution at the age of 12, but lived in a group home at the time of the program. Her history had indicated suspected neglect and abuse.

K.C.'s cognitive level measured below one year and she displayed no expressive language. She had the appearance however of being higher functioning and much more socially aware than her test scores indicated. This was due in part to her extremely noncompliant behavior in task-oriented situations. Her self-abuse too appeared to be part of a consistently non-compliant, yet attention-seeking mode of behavior. Her typical day was marked by constant pacing in a seemingly aimless fashion around whatever room(s) she happened to be in. If directed to sit at a table to work or to engage in any of many other activities that she

didn't care for, she would bang her head with extreme force on a hard surface such as a wall, the floor, or a table. She would also hit the bottom of her chin forcefully with her fist. All of this was usually accompanied by screaming and crying sounds. K.C. would also engage in these behaviors while simply walking around the room under no demands. This appeared to be attention-seeking as she would cease the behavior if someone approached or held her. This type of behavior increased significantly in the presence of men. At the time of the program she had many scars and lacerations at various stages of healing on her forehead, scalp, and chin areas.

K.C. seemed very aware of the classroom environment and noticed changes in routine and staff. She also exhibited sudden changes in affect, from smiles and laughter to screaming and self-abuse. Immediately prior to entering this program her self-abusive behaviors were being dealt with in the classroom by means of extinction (at lower levels) and manual restraint at higher intensities. She was on psychotropic medication at the time of the study.

The objectives of this program for K.C. included the following:

1. Alter her behavior plan in her classroom setting in such a way as to utilize appropriate physical contact and walking as reinforcements for non-self-abusive, task directed behavior and provide immediate protection against self-abuse without physically holding her. See Appendix for behavior plan dated 2-24-86. This plan was implemented simultaneously with the massage therapy program.

2. Decrease agitation and provide experiences in appropriate physical contact, thereby decreasing the need for seeking contact inappropriately (i.e. through self-abuse and sexually overt behaviors).

Research Question One

The overall frequency of self-abusive behaviors remained very constant through baseline and the program periods (Table 2). It was however observed by classroom staff that the intensity of self-abuse decreased and the ease with which she was redirected increased throughout the program. This will be discussed further on.

Research Question Two

As an indicator of agitation the frequency of K.C.'s screaming behavior decreased by half (Table 2). Since screaming usually occurred in combination with self-abusive behavior, this decrease supported the observation of an overall decreased intensity of these episodes.

Descriptive Observations

The beginning of massage therapy sessions was immediately affected by the concurrent implementation of the new behavior plan. This plan increased the demands placed on K.C. by requiring her to stay in her seat, unless her activity called for her to be up or if she was being taken on a walk as a specific reinforcement for compliant work behavior. The therapist noted a high agitation level and very resistive behaviors during this time.

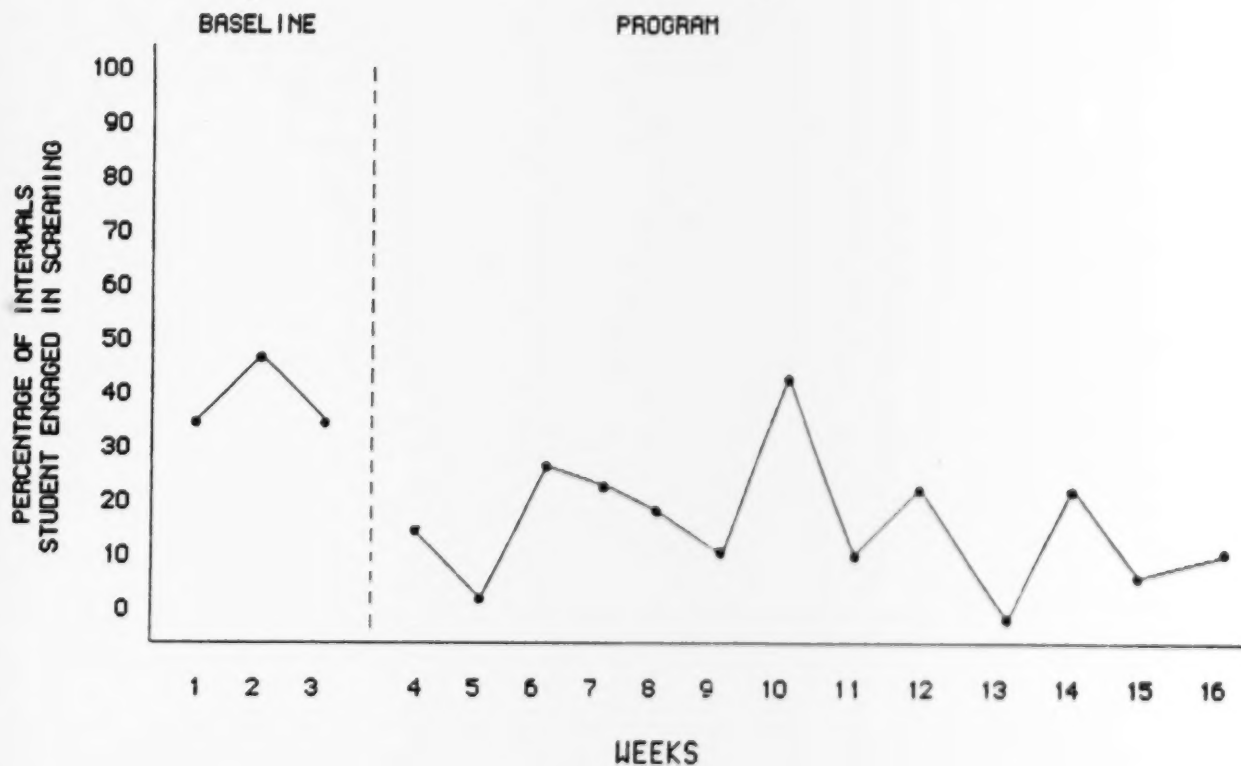
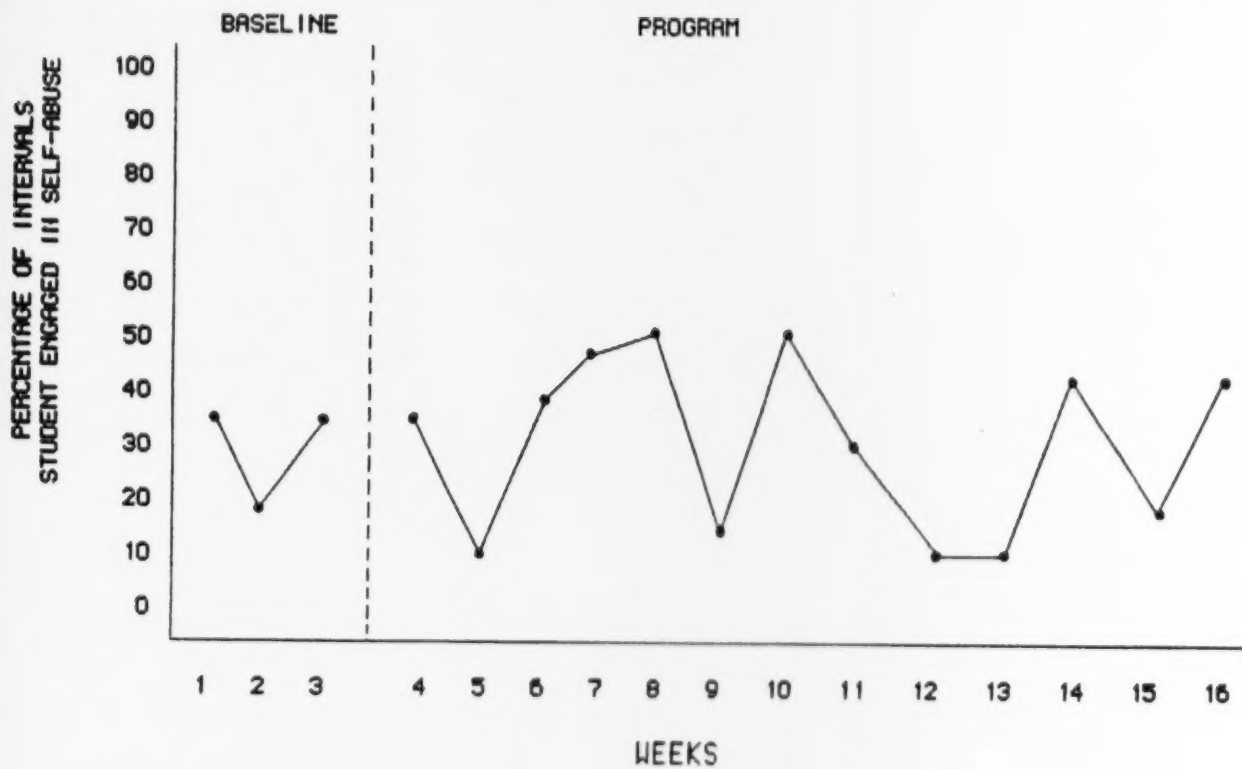


FIGURE 4 K.C.

Initial sessions were meant to introduce K.C. to the purposes and procedures of massage therapy. This included simply trusting enough to stay on the table and to cooperate enough to extend her hands away from her ears and face in order to be worked on. Some directives of the therapist were met with by self-abusive responses, but these were quickly brought under control using verbal directives and physical prompts to stop. During the first several weeks the therapist noticed the following:

1. K.C. would resist most cranial work or any touching of her head by pushing the therapist's hands away. By the fifth week she was beginning to tolerate touch to this area and in fact put the therapist's hands on to her head.
2. She began to remove her own hands from her head very slowly.
3. K.C. achieved some very calm states, even sleeping by the third week.
4. Although initially resistive to massage work on her arms, legs, and stomach, she very gradually improved in this but tended to prefer the supine position.
5. K.C. was very resistant to self-care related to the sessions (e.g. taking shoes and socks off). This began to improve by the seventh week.

By the seventh week it was also noted that K.C.'s complexion and the wounds on her head had improved noticeably. When the therapist worked on high stress areas (neck and upper back) she often showed resistance. By the last weeks of the program K.C. was generally very relaxed by the

end of sessions, but still resisted certain techniques. Her complexion and skin condition in general remained excellent throughout the program.

K.C. showed very good progress in increasing her compliance to staying in her seat for her work activities according to her revised behavior plan. In summary, this program was considered a success for the following reasons:

1. K.C. tolerated significant increases in work demands both in the classroom and massage therapy situation without a quantitative increase in self-abuse.
2. The intensity and manageability of her self-abuse improved greatly as evidenced by:
 - a. decreased screaming;
 - b. improved physical condition of abused areas;
 - c. and staff reports of improved inhibition of self-abuse to behavioral techniques of verbal directives and light physical prompts.
3. K.C. showed overall gains in health functions including improved complexion and menstrual regularity.

Case Five - B.B.

B.B. was a 25 year old ambulatory male with severe mental impairment and autistic characteristics. As a baby he showed no interest in his environment, slept very little, and exhibited ritualistic finger gesturing. By 2-3 years of age he began having severe temper tantrums and was uncontrollable.

As an adolescent he became self-abusive and violent and subsequently was placed in an institution. Behaviors included biting, kicking, feces smearing, jumping out of windows, and purposeless somersaults. He would rip and chew his own clothing, bang his head severely, and bite his arm. While institutionalized, he began eating cigarette butts and was very sophisticated about searching for them around the facility.

Because of some falls that he had experienced, he had a history of many broken bones and continued to have an open skull area due to crushed cranial bones. He often appeared to be in pain. He was a slim young man but very muscular especially in the upper back and arms.

He was non-verbal, but made non-communicative noises at times. He communicated through gestures and by approaching staff. When compliant he would follow one and two step commands. He fed and dressed himself independently.

B.B. attended school for half day sessions. He appeared to have difficulty tolerating longer days and would predictably become aggressive and self-abusive beyond the half day. In his self-contained classroom for students with behavior problems he followed a structured program, but when too many demands were made of B.B. more outbursts would occur. His behavior plan for self-abuse and aggression included:

1. social disapproval - "Stop, B."
2. exclusion from others - time out on a padded mat to get himself together.
3. restraints - for high intensity when his self-abuse/aggression did not decelerate. He was physically managed to the floor, prone position, and into a jacket restraint until calm. This usually required 2-3 people.

He continued to have a poor sleep pattern, averaging between 4-6 hours of sleep per night in the institutional setting that he continued to reside in. Within these hours his sleep was frequently interrupted by periods of wakefulness. On days when he had less sleep, his aggressive behaviors increased.

B.B. was not accepting of new people in his life. He had developed a good working rapport with his classroom staff, but was uneasy with others. He rarely interacted with peers except to hit or kick them when he was aggressive or had been attacked.

The specific objectives of massage therapy for B.B. were similar to those for L.S., with the exception of a lack of emphasis on cranial work because of the severe permanent damage done to this area of his body. It was therefore to increase his tolerance of physical contact so as to explore techniques that might produce a generalized relaxing effect on B.B., with the particular aim of improving his pattern of sleep.

Research Question One

The frequency rate of self-abuse for B.B. increased by 7% from baseline to the program period (Table 2). This represents a very small increase in the behavior, which was at a very low frequency even during the baseline period. B.B.'s self-abusive behaviors tended to be more like M.A.'s in that they occurred with low frequency but very high intensity. In retrospect it may have been more beneficial to have taken, as was done with M.A., data on episodes of high intensity self-abuse per day.

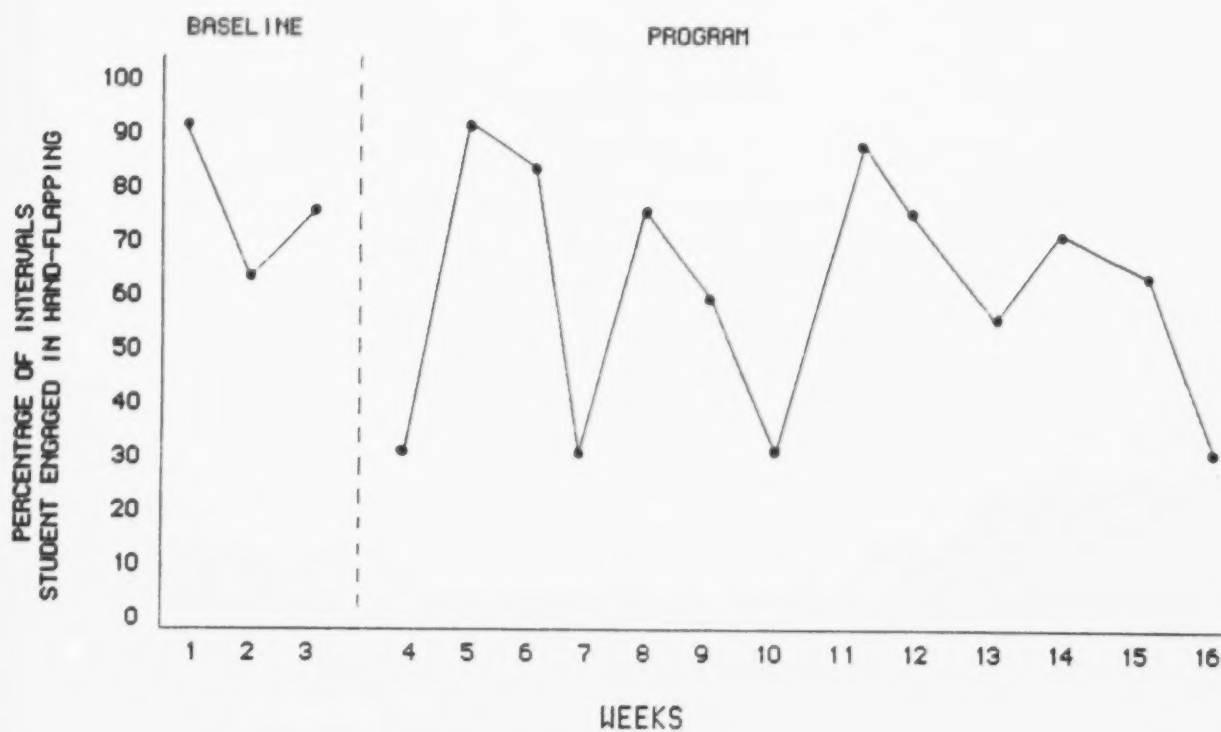
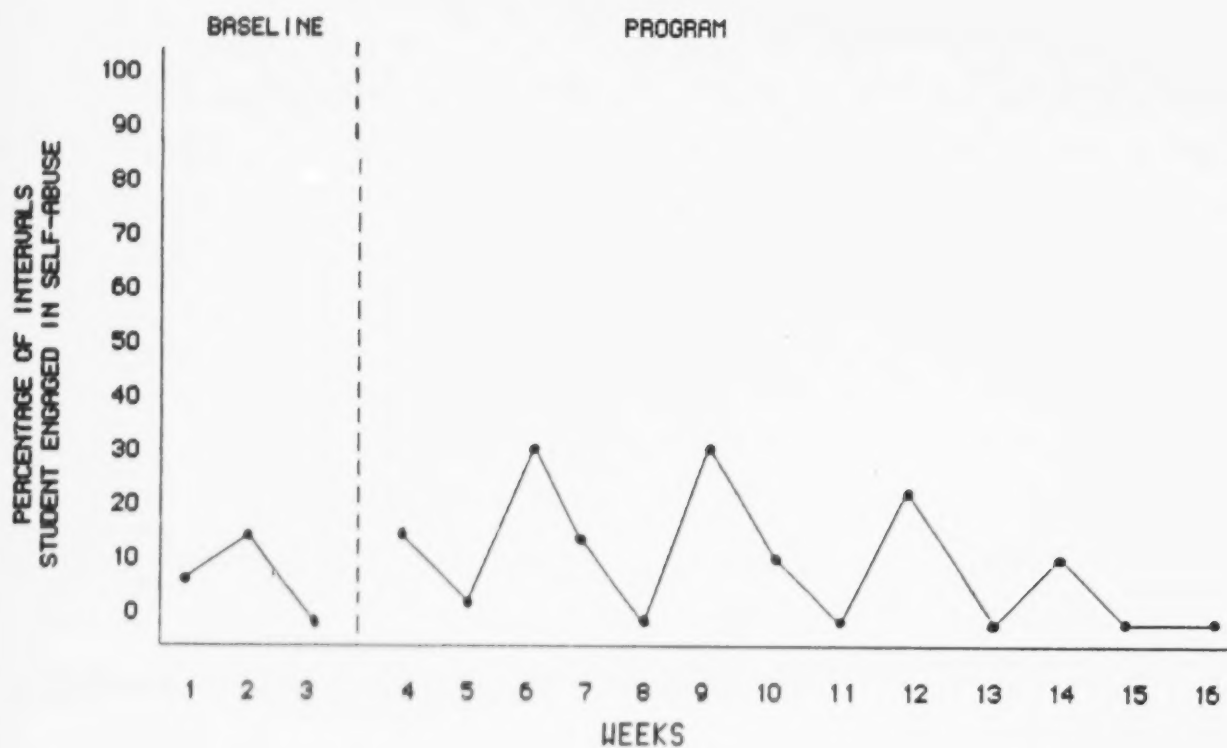


FIGURE 5 B.B.

Research Question Two

Hand-flapping, defined as repeated movement of fingers to palm, was selected as a behavioral indicator of agitation. This behavior decreased 19% from the baseline to program periods (Table 2).

Descriptive Observations

The initial attempts of the massage therapist were aimed at getting B.B. to tolerate the therapy situation and simple physical contact. Over the first few weeks B.B. demonstrated the following responses:

1. persistent refusal to go anywhere near the massage table;
2. some compliance to directives such as "give me your arm", but refusal to allow any touch or stroking more than a few seconds;
3. minimal tolerance of touch to his head and then would hit his own head or the therapist's hands with force;
4. repeated striking out at the therapist;
5. many days he smelled strongly of nicotine and would take the therapist's hands to his face for the smell of nicotine;
6. an increase in agitation surrounding sessions with the therapist.

Over the next several weeks the therapist experimented with situations and procedures to increase his trust or tolerance, such as working with familiar staff, modeling, using more relaxing or familiar environments, change of positions, and shortening the length of time. After nine weeks it was determined that no progress was being made, and in fact the sessions appeared to have an agitating effect on him.

The last few weeks of the program were modified to incorporate simple appropriate touching activities within his daily classroom routine. For example, B.B. had the habit of slapping a person's hand very hard when greeting by handshake. People naturally avoided this activity with him. Emphasis was placed on teaching him the notion of "nice touch" in this context and he responded quite well. Within a few weeks staff were commenting on how he was much more approachable. Attempts were being made to increase small amounts of naturally occurring physical contact.

In summary, it was concluded that massage therapy was inappropriate for B.B. for probably at least three reasons:

1. his physical condition and experience of pain prohibited physical contact;
2. his autistic tendencies interfered with tolerating physical contact;
3. and a history of violence and aggression seemed also to interfere in this area.

B.B. did not show any enduring detrimental effects from the program. In fact at least two positive developments were noted - decrease in hand-flapping and increase in ability to shake hands.

CONCLUSION

A few confounding factors to objective evaluation occurred during the course of this study, such as medication changes for I.C. and L.S., and for K.C. a behavior plan change. Some of these occurred independent of the massage therapy program and some occurred because of it. In

either case these changes are not unusual in the lives of these students. Practitioners know that behavior plans, medications, and such things as residency and staff relationships change for these students often with unfortunate regularity. So while it is true that the data from this evaluation may be affected by external factors of change, it also captures something that is typical of the lives of many severely handicapped students with behavior problems.

The program of massage therapy appeared to benefit three of the five students involved. For I.C., M.A., and K.C., quantitative improvements were observed in four out of five total measures. Many qualitative improvements occurred as well for these students such as I.C.'s increased verbalizations, M.A.'s increased functional hand use, and K.C.'s improved condition of health. It was the feeling of staff that all of these students had a great deal farther to go in challenging their potential and reducing their self-abusive behaviors. It is recognized that sixteen weeks is not a long time to work with a student with severe impairments, especially those with long-term, chronic behavior problems. Some type of extended maintenance program would be recommended for these students if other factors in their lives remained stable.

L.S. and B.B. presented unique challenges for the management of their agitation behaviors. Their severe autistic characteristics, including resistance to physical contact made the use of massage therapy extremely difficult. Perhaps certain techniques that require less stimulation such as craniosacral therapy may hold some potential for use with L.S., but for B.B. probably not. Their problems with agitation

could be addressed through environmental relaxation techniques (e.g. music, lighting, stimulus control), structured exercise, increasing expressive communication, or altering other aspects of their educational programming.

References

- Berg, J.M., McCreary, B.D., Ridler, M.A.C. (1970). The DeLange Syndrome. Oxford: Pergamon Press.
- Carr, E.G. (1979). The motivation of self-injurious behavior: a review of some hypotheses. Psychological Bulletin, 84, 800-816.
- Cataldo, M., and Harris, J. (1982). The biological basis for self-injury in the mentally retarded. Analysis and Intervention in Developmental Disabilities, 2, 21-39.
- de Lissovoy, V. (1963). Head banging in early childhood: a suggested cause. Journal of Genetic Psychology, 102, 109-114.
- Libby, J.D., Polloway, E.A., and Smith, J.D. (1983, October). Lesch-Nyhan Syndrome: a review. Education and Training of the Mentally Retarded, 226-231.
- Tappan, F.M. (1980). Healing Massage Techniques. Reston, VA: Reston Publishing Co., Inc.
- Thie, J.F. (1973). Touch for Health. Marina del Rey, CA: DeVores and Co.
- Upledger, J.E. (1982). Childhood behavioral problems. Journal of Applied Nutrition, 34, 112-133.
- Upledger, J.E. (1983). Craniosacral function in brain dysfunction. Osteopathic Annals, 11, 57-66.
- Upledger, J.E., and Vredevoogd, J.D. (1983). Craniosacral Therapy. Seattle: Eastland Press.
- Wells, M.E., and Smith, D.W. (1983). Reduction of self-injurious behavior of mentally retarded persons using sensory-integrative techniques. American Journal of Mental Deficiency, 87, 664-666.

A P P E N D I X

<u>Student</u>	<u>K.C.</u>	<u>Birthdate</u>	<u>4-12-63</u>
<u>Date</u>	<u>February 24, 1986</u>	<u>School</u>	<u>Hale</u>

Behavioral Program - Level One

A. Positive Program

1. Target Behaviors defined:

- a. Non self-abusive behavior.
- b. Appropriate in-seat behavior.
- c. On-task behavior.

2. Procedures to be implemented:

- a. Frequent naturally occurring verbal praise should be given to K.C. when she is not self-abusive. Require K.C. to be in her seat at all times unless she is on her walk reinforcement or unless her activity calls for her to be out of her seat. Use verbal and physical prompts as necessary to direct her to her seat. If K.C. complies with appropriate in-seat behavior without engaging in self-abusive behavior administer frequent (every 5-10 minutes) intermittent positive reinforcement:
 - (1) positive physical contact (procedures to be designated by myomassologist)
 - (2) verbal praise
 - (3) drinks of water
 - (4) preferred leisure activities such as water play.
- b. After K.C. completes a task without self-abuse she should be taken on a walk (e.g. 2-3 laps around the gym or to someplace outside the classroom - walking should not be aimless wandering). Clear verbal explanations of her reinforcement

should be given to K.C. During early phases of this program walk reinforcement should occur as often as every 15 minutes. This can be phased to every 30-45 minutes as she progresses. If K.C. self-abuses during a walk employ decelerating technique.

c. Record walk reinforcement on weekly data sheet.

B. Decelerating Program

1. Target Behaviors defined:

All forms of self-abuse including:

- a. head-banging
- b. chin-hitting
- c. hand-biting.

Screaming will be ignored.

2. Procedures to be implemented:

If K.C. is observed to engage in self-abusive behavior immediately give her a verbal and physical prompt directive, "Stop, Hands Down!". This can be repeated 2-4 times. Explain simply the consequences of her behavior. If she persists in self-abuse put on her protective helmet and escort her to the relaxation area with a not secure key. Have her come out of this area in 5-10 minutes if she has stopped the self-abuse. Do not allow her to become comfortable in this area. Redirect her to her seat for her next activity.

3. Record all instances of self-abuse and interventions on her weekly data sheet.

PART TWO

MASSAGE THERAPY IN THE TREATMENT OF INSOMNIA
AND SELF-INJURIOUS BEHAVIOR:

A Longitudinal Case Study

INTRODUCTION

Self-injurious behavior (SIB) is one of the most complex problems exhibited among severely and profoundly mentally-impaired students. This includes behaviors such as face-hitting, hand-biting, and head-banging. Carr (1977) points out that SIB (even within the same person) may be under the control of multiple motivational factors, the locus of which may be either external or internal to the individual. Theories of external motivation such as positive social reinforcement for the behavior or avoidance of unpleasant stimuli (e.g. engage in SIB to avoid working) are well documented in the research literature. More recently Donnellan, Mirenda, Mesaros, and Fassbender (1984) have elaborated on many specific communicative functions of SIB.

Carr's review of theories of internal motivation for SIB include the self-stimulation hypothesis and the organic hypothesis. The self-stimulation theory suggests that SIB is part of a pattern of self-stimulatory behaviors in the individual that attempt to compensate for a lack of sensory stimulation from the environment. This theory was the basis for a great deal of research in the 1960's, but Carr concluded that it remained essentially untested because of many methodological problems in those studies.

The organic hypothesis as reviewed by Carr examines two genetically-based syndromes (Lesch-Hyhan and Cornelia de Lange), the condition of otitis media (middle ear infection), and heightened pain tolerance in general, as etiological factors for SIB in some individuals. It is

generally recognized that the SIB of these individuals may eventually come under the influence of social stimuli over long periods of time.

Cataldo and Harris (1982) expanded the organic theory in a pioneering article that attempted to construct the beginnings of a bio-behavioral basis for SIB. The authors argue effectively for this integrative approach to the problem. They observe that while behavioral strategies are the treatment of choice for most people with SIB (Favell, et al. 1982), they are not always successful in reducing the behavior or maintaining treatment effects. The authors recognize that only rudimentary knowledge of the biological basis for SIB presently exists, but that this area of study is essential for the development of more effective treatment programs.

Cataldo and Harris postulate from anatomical and bio-chemical research that biological arousal, especially in the form of increased central nervous system activation, can cause increased stereotypical behaviors and SIB. On a bio-chemical level these behaviors trigger the increased production of endogenous opiates in the brain which have the effect of reducing the activation level of the CNS. Thus, the organism controls its level of arousal. The authors state that for the mentally impaired the stimulus to increased arousal may be the result of an organic condition or environmental stresses, such as situations which are confusing or threatening.

The pituitary-adrenal system is the biological mechanism by which autonomic arousal and stereotypical behaviors, including SIB are regulated. The increased production of certain endogenous opiates which

serve to reduce pain are also related to increased activity of the pituitary-adrenal system. The authors suggest that these chemicals can have highly reinforcing, even addicting effects on a mentally-impaired individual.

POST-HOC CASE STUDY

This paper will describe the case of a student whose SIB appeared to have a basis similar to that described by the theory of Cataldo and Harris. There were such clear biological and behavioral aspects to his SIB that an effective treatment program required different interventions to address each of these problems. The treatment utilized to address the physiological aspect of his condition, which included chronic insomnia, was massage therapy. Several behavioral techniques were used to manage his overt self-injurious behaviors. This study was post-hoc in the sense that interventions were selected in part, on a trial and error basis. Behavioral interventions were begun immediately upon the student's entry to the program where the study took place. The study did not begin with an experimental design and therefore lacks the controls of experimental research. This paper is an attempt to recoup data and utilize anecdotal observations and historical documents that will describe this student, his behaviors, and the qualities of this program as accurately as possible.

CASE STUDY - N.W.

Background

N.W. was a 15 year old ambulatory male who attended school in the inner city of a large urban area. He was profoundly mentally impaired with an IQ of 17 measured by the Alpern Boll Developmental Profile. He had no expressive language, but was able to follow a few simple verbal directions. His physical appearance was handsome though extremely slight as he weighed only 46 pounds.

By the age of three he had been placed in a nursing home due to his severe impairments including self-injury. There were unconfirmed reports that his natural mother had been a drug addict and had died within a few years after his birth. A psychological report on N.W. when he was 4 years old indicated that he had been subject to parental neglect and that self-injurious behaviors were present at that time, though less violent than they were in the past. This was the first indication in his records of a periodic fluctuation in his levels of SIB. During his time in the nursing home his typical behaviors were limited to manipulating strings, especially shoelaces. People and other objects were ignored. It was noted that he became hyperexcitable in the presence of food.

At 8 years old he was taken out of the nursing home and placed in a foster home which lasted for a few years before a couple more successive foster home placements. It was during this time that reports of his inability to sleep began to surface, but again it was noted that he had periods of improved behavior and regression. This pattern was noted in

a school psychological report when he was 10 years old. The next year a nurse's notes indicated the cycle was on an approximately monthly basis. This same monthly pattern was noted in a teacher's report the following year when he was 12 years old. From the time he was 10 to 15 years old reports indicated he had been on various regimens of psychotropic medications with no noticeable improvements in behavior.

In the two years prior to entering the behavioral program N.W. was in a classroom with other severely mentally-impaired students. He was still exhibiting periodic fluctuations in his overall condition and SIB. His behaviors in the classroom included persistent attempts to get out of his seat in order to lay on his side on the floor and play with his shoelaces. It was noted later that this position appeared to offer him security and he was less likely to engage in SIB. In the classroom this "out of seat" behavior was dealt with through the use of a seat belt to keep him in his chair. His self-injurious behaviors included forceful fist blows to both temple regions and repetitive rubbing of both ears on his shoulders. A football helmet was placed on his head, but this did not prevent these behaviors from drawing blood during his difficult times. Reports from his foster mother indicated that she kept the football helmet on N.W. most of the time including night time. She was very distressed that N.W. seldom ever slept and would stay awake most of the night making loud droning sounds. N.W. was given up by this foster parent when he was 14 and was out of school for a period of two months before another foster placement was found with one of the employees of the school he attended. When he returned to school at that point he entered the school's behavioral program.

Behavioral Education Program

When N.W. entered the behavioral program he had four areas on his face that had open bleeding sores including both temporal regions and both ear lobes. His old football helmet was discarded immediately because of its ineffectiveness. The first order of business was to provide effective protection for his SIB and to stop his bleeding. This became even more imperative as it was discovered at that time that he was a Hepatitis B carrier.

The rubbing of his ears on his bony shoulders had a very intense and involuntary quality to it. The frequency of the behavior was nearly constant. The more physically agitated he became the harder and quicker he would rub his ears. At times he would alternate from one ear to the other so quickly that his head appeared to have a whipping effect. Usually he would close his eyes and tighten the rest of his body while engaging in this behavior. Attempts at stopping this behavior through verbal directives, redirection to an activity, or even physically holding him were completely ineffective. He appeared to have no ability to inhibit this once it began. This behavior was dealt with through the use of a foam collar that provided padding to the neck from the collarbone to beneath the base of his ears. The collar was worn most of the time and provided immediate improvements for this behavior. N.W. accepted it readily and it was apparent that it provided a sense of security for him. He still engaged in the behavior of ear rubbing, but with less intensity. The sores on his ears began to improve but were reopened at times even with the padding in place.

5

N.W.'s fist to temple blows were slightly more amenable to behavioral interventions. They were usually triggered by some slight disturbance around him, such as an increase in noise or movement, or his own change in posture. Frequently, however, even when he appeared comfortable he would begin the blows which usually were repeated until stopped by someone else. He bloodied himself very quickly. After a few weeks of trial it was decided that these behaviors would be managed through a three step process:

1. First attempts would be dealt with through verbal directives to stop and to put his hands down. Frequently N.W. would hold one wrist very tightly with the other hand extended in front of his body in a form of self-restraint;
2. Further attempts to hit himself were dealt with through a sensory extinction procedure of blocking his temporal regions with one's own hands while standing behind him and allowing him to gain control of his hands by placing preferred objects in front of him or allowing him to hold his own hands. Sensory extinction was a viable technique with N.W. because it was very unusual for him to attempt to strike another part of his body other than the temporal regions;
3. If N.W. persisted with fist blows beyond ten to twelve attempts, wrist restraints were applied until he calmed down enough to bring his hands under control, which usually took 5 to 10 minutes.

These behavioral procedures were effectively employed throughout the entire program. After several months in the program a soft foam helmet was specially designed to cover his temple and ear regions and was used during the nighttime for protection.

Educational objectives throughout the entire period that he was in the behavioral program included:

1. increase manipulative schemes with objects;
2. improve walking skills;
3. pattern feeding program;
4. increase independent toileting skills;
5. and improve tolerance of change in postures.

Physiological Agitation

During the second month that N.W. was in the behavioral program his foster mother reported the extreme difficulties she had with him during the night. She said that the most he ever slept was one or two hours per night, which of course had a very disruptive effect on her family because she had to watch him for SIB. He was on psychotropic medications at the time and these were altered (Baseline-week 16) to increase his nighttime dosage. For a few days he slept three or four hours before waking up in the middle of the night in an agitated state. These medications were discontinued (Baseline-week 17) because it was felt by the foster mother that they only aggravated him more.

At school he appeared extremely jittery and his sleeplessness was apparent as he would frequently close his eyes for a few minutes before

startling into an agitated state. As in his previous classroom, he frequently sought out a sideways reclining position on the floor, but would first find a pillow to tuck underneath his neck before laying down. This was dealt with by allowing him one rest period per school day for 45 minutes after lunch and redirecting him to his educational activities at other times. Attempts were made to increase his exercise so as to "wear him out" for the night time. Unfortunately walking was extremely difficult for him because he usually became over-stimulated and would stop and withdraw into a rigid, almost fetal position with closed eyes and shortened breathing. He would almost appear to lose consciousness and at times began his pattern of SIB. This pattern of response was characteristic of N.W. in other stimulating situations such as eating. (His appetite was ravenous, but he often became so stimulated as he approached the food that he fell into this withdrawn state and would require 10 to 15 minutes to gain control enough to eat.)

A relationship between sleep loss and self-injurious behavior in mentally retarded people was noted by Matin and Rundle (1980). Their study compared various physiological functions of a group (n=17) of mentally retarded clients that exhibited SIB with a group (n=14) of mentally retarded clients that did not exhibit SIB. In an analysis of nine physiological indicators of disturbance (e.g. overactivity, temperature, screaming) the area of greatest difference between the two groups was quantity of sleep, with the SIB group having significantly fewer hours of sleep.

In a review of treatments of chronic insomnia Cleghorn, Bellissimo, Kaplan, and Szatmari (1983) noted that a major conceptual model for the problem is related to high levels of tension or arousal. The authors suggest that hypnotic drug treatments for patients with chronic insomnia pose serious hazards. Behavioral treatment is described that teaches the person skills to manage the specific behavioral variables found to perpetuate their insomnia. Other behavioral treatments for insomnia (in populations of normal intelligence), such as hypnosis, muscle relaxation training and biofeedback have been discussed by Montgomery, Perkin and Wise (1975). All of these treatments however, require cognitive and communication skills beyond the level of a profoundly mentally-impaired individual.

In summary N.W.'s overall condition and physical appearance was that of an extremely tense, muscularly rigid individual with obvious growth and metabolism dysfunctions. His behavior was marked by a cyclic pattern of agitation characterized by periods of intense and specific SIB and significant sleep loss. Other physiological indicators of agitation included disturbances of breathing, frequent repetitive, rhythmic vocalizations, and hyperexcitability to simple movements and food stimuli. He had a history of not being favorably responsive to drug treatments.

The conceptual basis for N.W.'s behavioral program included an emphasis on treatment of his insomnia. Despite the cyclic basis of his agitation, it was felt that the sleep loss was the most significant variable related to his general condition that would be amenable to behavioral treatment. It was thought that improvements in his pattern

of sleep would have multiple, generalized benefits for his condition, including SIB.

The selection of massage therapy as a treatment for the condition of insomnia and generalized agitation was based on the following reasons:

1. A principal objective of massage therapy is the inducement of a deep sense of relaxation;
2. Other than specific contraindications such as blood circulation problems, there are no negative side effects to the therapy;
3. While it was recognized that other relaxation techniques such as progressive muscle relaxation (Cautela and Groden, 1981) and EMG feedback (Schroeder, Peterson, Solomon, and Artley, 1977) have been used with mentally impaired people with SIB, it was felt that massage therapy would offer more potential in this case because its direct physical application would provide a more intensive intervention and did not require higher communication skills on the part of the recipient.

PROCEDURE-MASSAGE THERAPY

After 17 weeks in the behavioral-education program N.W. was begun on the program of massage therapy. This consisted of three or four scheduled sessions per week (each approximately 45 minutes) for a period of 6 weeks. Most sessions were conducted during the course of his school day, though a few took place at his home.

Sessions were typically conducted in the following sequence:

1. effleurage strokes to both arms;
2. rotation and exercise of the shoulders, elbows, and wrists;
3. hand massage;
4. effleurage and alternate thumb strokes to both legs;
5. rotation and active and passive exercise of the hips, knees, ankles, and toes;
6. petrissage and light pressure to the abdomen;
7. acupressure applications to the head and neck;
8. circular movements up the back and a relaxing push and pull motion to the tops of the shoulders.

A more detailed description and analysis of body functions, massage techniques, and student responses will be provided further in the paper.

DATA COLLECTION

Behavioral classroom staff were responsible for collecting daily measures on the frequency of the use of restraint devices for episodes of high intensity SIB. These episodes were defined by step three of N.W.'s behavioral program as described earlier in the paper. While no specific reliability measures were taken for these events, the documentation required by the school district for every use of restraint involved a written monitoring procedure reviewed by a teacher consultant and school principal.

The actual frequency of all SIB is not represented in the data. While many instances of SIB managed at steps one and two of the behavior

program were recorded, the reliability of these measures as compared to step three interventions was less. It may be correctly assumed that there were more instances of total frequency of SIB than is reflected by a measure of step three interventions alone.

As previously mentioned data on nighttime sleep was not taken by N.W.'s foster mother until he had been in the behavioral program for nearly two months. Therefore, while data on the use of restraints for SIB in the classroom began at week one, sleep data was not begun until week eight. This data was taken for several weeks after the program ended. Frequency of sleep however was sampled again eight months after the end of the original program. Each behavior therefore had different lengths of baseline before the massage therapy which began in week eighteen. For each night N.W.'s foster mother simply recorded whether he slept more or less than four hours. No measures of reliability could be taken for this data in this situation. The disruptive quality of N.W.'s nearly constant noise making provided a good indicator of wakefulness to his foster mother.

RESULTS/DISCUSSION

Descriptive-Massage Therapy

The initial impressions of the massage therapist regarding N.W. included the following:

1. He had significant restriction of tissue at the base of the occipital extending from that point to the third cervix.

2. He also had a great deal of restriction in outward movements of all limbs affecting his entire mobility.
3. He had four areas of his body that were extremely sensitive and resistant to touch including:
 - a. a small pocket of tissue in the area of the small intestine;
 - b. the right hip which was anteriorly rotated and caused the right leg to be one and a half inches shorter than the left;
 - c. his entire neck and head area;
 - d. his back.

N.W.'s initial reaction to the massage session was resistance and increased agitation (as it was to most activities). The therapist began with long strokes (effleurage and petrissage) on the arms and legs. His agitation subsided within minutes and he began to straighten out his hips and laid calmly by the end of the first 30 minute session. These procedures were repeated at the beginning of sessions for the next 3-4 weeks. He fell asleep during the last 10 minutes of the second session. By the third session the therapist began rotations of his shoulders, elbows, wrists, and fingers. He began to sustain these outward arm positions in therapy and was even observed to initiate them during other times throughout the school day. This relaxed extension of his arms was a new behavior observed by classroom staff. Three days after therapy began he was also observed to fall into a "sound" sleep at different times throughout the school day.

Over the next few weeks the therapist began to apply pressure to the base of the occipital bone (constriction of this area is thought to be a

problem associated with sleeplessness). N.W.'s response to this was to push his head into the pressure on this area. This technique, though at times difficult for N.W., was continued throughout the six week period with noticeable improvement in this area resulting.

Other aspects of his program continued to emphasize basic massage strokes and rotation of various joints for flexibility and release of tension. Through pelvic rotations his right hip was brought down so that only a quarter of an inch difference remained between the length of his legs. After a few weeks N.W. was observed for the first time to run down the school hallway! The total quality of his walking vastly improved including especially his endurance.

Over the course of the six weeks N.W. exhibited many varied reactions to the massage therapy. Responses ranged from agitation and self-abuse to distinct enjoyment, relaxation, relief from distress, relaxed breathing and sleep. Massage therapy with N.W. was a great deal of hard work for therapist and client.

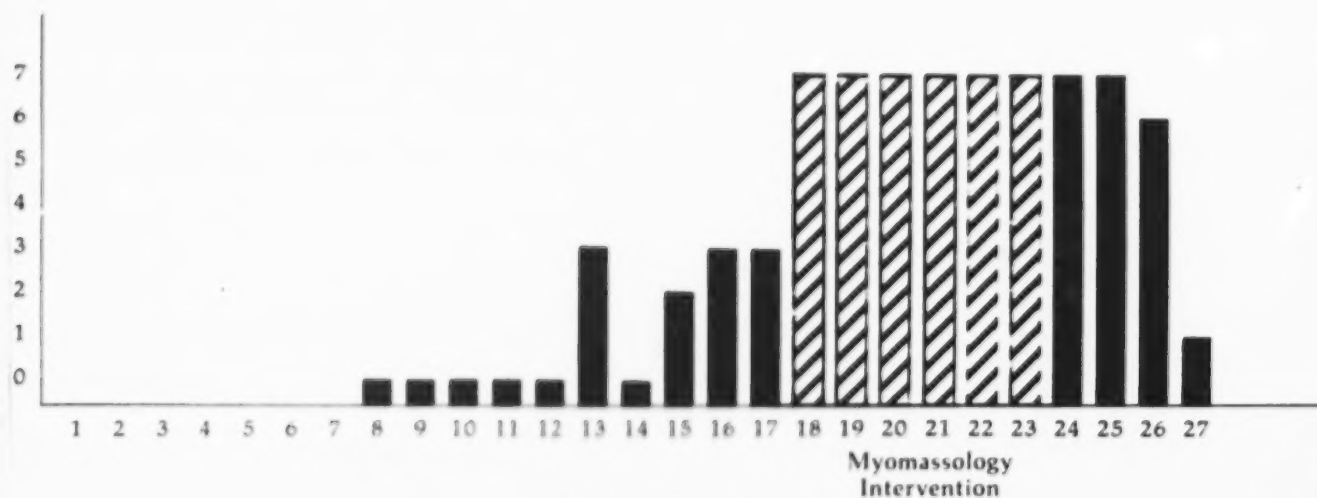
Sleep Behavior

Figure 1 shows a measure of quantity of sleep from week 8 to week 27 of the program. This graph shows the number of nights per week that N.W. slept 4 or more total hours. It is obvious that his pattern of sleep changed drastically with the introduction of massage therapy. He immediately began to sleep 9 to 12 hours per night. The quality of this sleep improved dramatically in that it was uninterrupted, unlike the fragments of easily disturbed sleep that he got prior to that time.

N.W. received one massage therapy session in each of weeks 24 and 25 as a fade out procedure. He received none during week 26 and one at the end of week 27 when it became apparent that his pattern of sleep was beginning to deteriorate again. At that point V.W.'s foster mother contracted with another massage therapist to continue the therapy on a weekly basis. Quantitative data collection on nighttime sleep was discontinued. The foster mother reported however that he regained the pattern he had during the intervention period, with only infrequent periodic disruptions. A sample of his quantity of sleep was taken several months later (during weeks 57,58,59) that indicated he was averaging 8.5 hours of sleep per night.

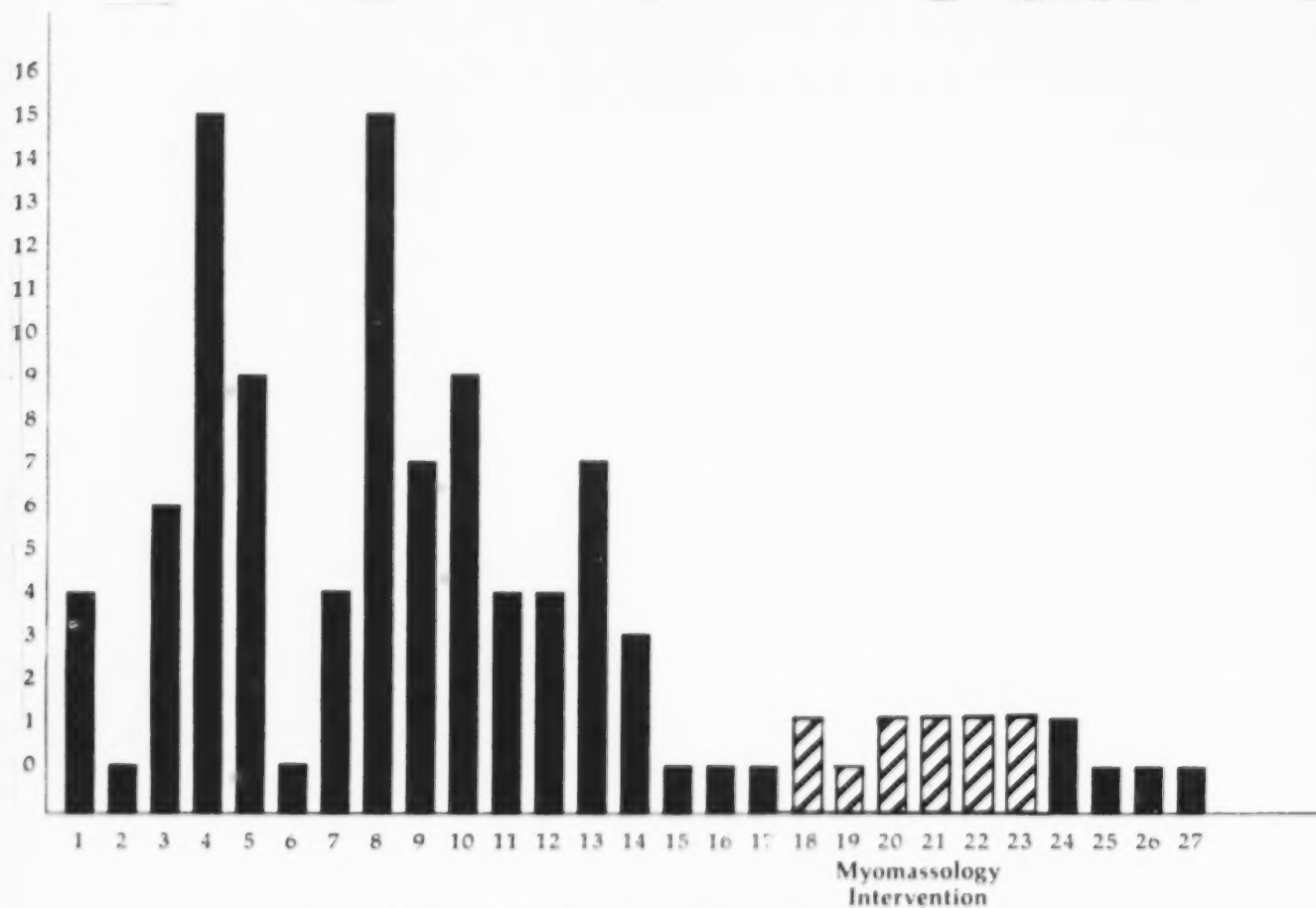
N.W.'s foster mother felt that he continued to exhibit cyclic changes in his levels of agitation throughout the entire period under study. This opinion was shared by classroom staff and the massage therapist. Adjustments in his therapy schedule were made to accommodate this, increasing during difficult times and reducing during his better periods. N.W. has remained off all psychotropic and relaxant drugs during this time.

All school staff that came into contact with N.W. recognized a remarkable change in his appearance and behavior. He began to acquire a rested and healthy look in his face, which had appeared very stressed. Of significance too was the fact that he stopped attempting to lay down in school after the first week of therapy, whereas this had been frequent behavior before. He was able to take long walks without falling into his previous constricted pattern. His manipulation of objects



Number of Nights with More Than 4 Hours Sleep Per Week

FIGURE 1



Use of Wrist Restraints for Self-Abusive Behavior Per Week During School

FIGURE 2

became slightly more playful. For example he began to shake a musical instrument purposefully whereas his arms and wrists had been too tight to allow this before. Not the least of which too, he appeared happier, smiling and getting "into trouble" more by searching things out at school and home.

Self-Injurious Behavior

Figure 2 shows the frequency of use of wrist restraints per week in school through baseline and the massage therapy program. (During baseline N.W. spent a great deal of his time at home in restraints.) Baseline clearly shows some periodic fluctuation in his levels of SIB. His SIB was becoming more manageable in the classroom even before massage therapy began. It would appear that this improvement and perhaps a low period of agitation existed for three weeks immediately prior to massage therapy. N.W. was being restrained about once a week during therapy. The increased demand of therapy itself at times contributed to these specific events. On the other hand, N.W. was now in a sustained period of low frequency of SIB. One week after therapy ended was the last time that N.W. was restrained for SIB for the next nine months. This was accomplished while keeping N.W. entirely free of bleeding due to SIB. Those affected areas of his face healed completely and even regained skin color that had been darkened for years.

It was observed that N.W. became much more favorably responsive to sensory extinction techniques for SIB after the massage therapy began. During baseline when his hands were blocked from hitting his temples he

would attempt to repeatedly pull away the obstruction so as to get directly to his head. After the massage therapy was in effect he began to accept the procedure. He would strike the area two or three times and then would stop on his own after finding it obstructed or padded. His highest levels of SIB can now be managed safely through sensory extinction and verbal directives alone. This is true in his home setting as well. N.W. no longer requires wrist restraints in that environment either.

CONCLUSION

The case of N.W. is full of varied influences and factors that defy simple or unqualified conclusions. His apparent internal cycle, the effects of drugs and medication withdrawal, short-term sicknesses, changes in foster homes, a new behavioral program, and the massage therapy itself provide a complex picture for interpretation. The limitations in the data taken in this case do not help in this task. Nonetheless, the importance of this case should be seen in the issues and possibilities that it raises rather than as demonstration or support of a particular hypothesis.

Clearly N.W. was a person whose SIB was related to a condition of chronically excessive arousal or agitation. His limitations in communication and socially-directed behaviors also supported a primarily biological basis for his SIB. The exact cause of his extreme agitation was of course unknown. The case lacked precise medical history or

diagnosis. The possibility of drug addiction and a metabolism disorder existed. Behaviorally, his chronic insomnia was no doubt an extremely aggravating factor to his condition. Psychotropic medications had been ineffective in alleviating this problem. An immediate change for the better in his pattern of sleep occurred with the introduction of massage therapy. While his internal cycle of change continued throughout the long-term course of the study, his sleep pattern remained at normal levels (with only occasional disturbance) throughout this time. The massage therapy appeared to act positively on his ability to sleep. His improved pattern of sleep appeared to have a generalized positive effect on his entire condition, including his SIB.

Probably the most important fact of this case is that N.W.'s foster mother was able to continue his care because he continued to sleep through the night and his bleeding stopped. N.W. functions well as a part of his family and the quality of his life is perhaps at its highest point. Those interested in the causes and treatments of SIB in general may find this case interesting for the possibilities it suggests for further research and practice.

References

- Carr, E.G. (1979). The motivation of self-injurious behavior: a review of some hypotheses. Psychological Bulletin, 84, 800-816.
- Cataldo, M., and Harris, J. (1982). The biological basis for self-injury in the mentally retarded. Analysis and Intervention in Developmental Disabilities, 2, 21-39.
- Cautela, J. R., and Groden, J. (1981). Relaxation: a comprehensive manual for adults, children, and children with special needs. Chicago: Research Press.
- Cleghorn, J.M., Bellissimo, A., Kaplan, R.D., and Szatmari, P. (1983). Assessment and treatment of chronic insomnia. Canadian Journal of Psychiatry, 28, 347-353.
- Donnellan, A.M., Mirenda, P.L., Mesaros, R.A., and Fassbender, L.L. (1984). Analyzing the communicative functions of aberrant behavior. The Journal of the Association for Persons with Severe Handicaps, 9, 201-212.
- Favell, J.E., Azrin, N.H., Baumeister, A.A., Carr, E.G., Dorsey, M.F., Forehand, R., Foxx, R.M., Lovaas, O.I., Rincover, A., Risley, T.R., Romanczyk, R.G., Russo, D.C., Schroeder, S.R., and Solnick, J.V. (1982). The Association for Advancement of Behavior Therapy Task Force Report: The treatment of self-injurious behavior. Behavior Therapy, 13, 529-554.
- Matin, M.A., and Rundle, A.T. (1980). Physiological and psychiatric investigations into a group of mentally handicapped subjects with self-injurious behavior. Journal of Mental Deficiency Research, 24, 77-85.
- Montgomery, I., Perkin, G., and Wise, L. (1978). A review of behavioral treatments for insomnia. Journal of Behavior Therapy and Experimental Psychiatry, 6, 93-100.
- Schroeder, S.R., Peterson, C.R., Solomon, L.J., and Artley, J.C. (1977). EMG feedback and the contingent restraint of self-injurious behavior among the severely retarded: two case illustrations. Behavior Therapy, 8, 738-741.

This work was developed in part with Chapter I, Education Consolidation and Improvement Act Program for the Handicapped Funds (formerly under Title I, ESEA, P.L. 89-313). However, the content does not necessarily reflect the position or policy of the U.S. Department of Education and/or the Wayne County Intermediate School District; and no official endorsement of these materials should be inferred.